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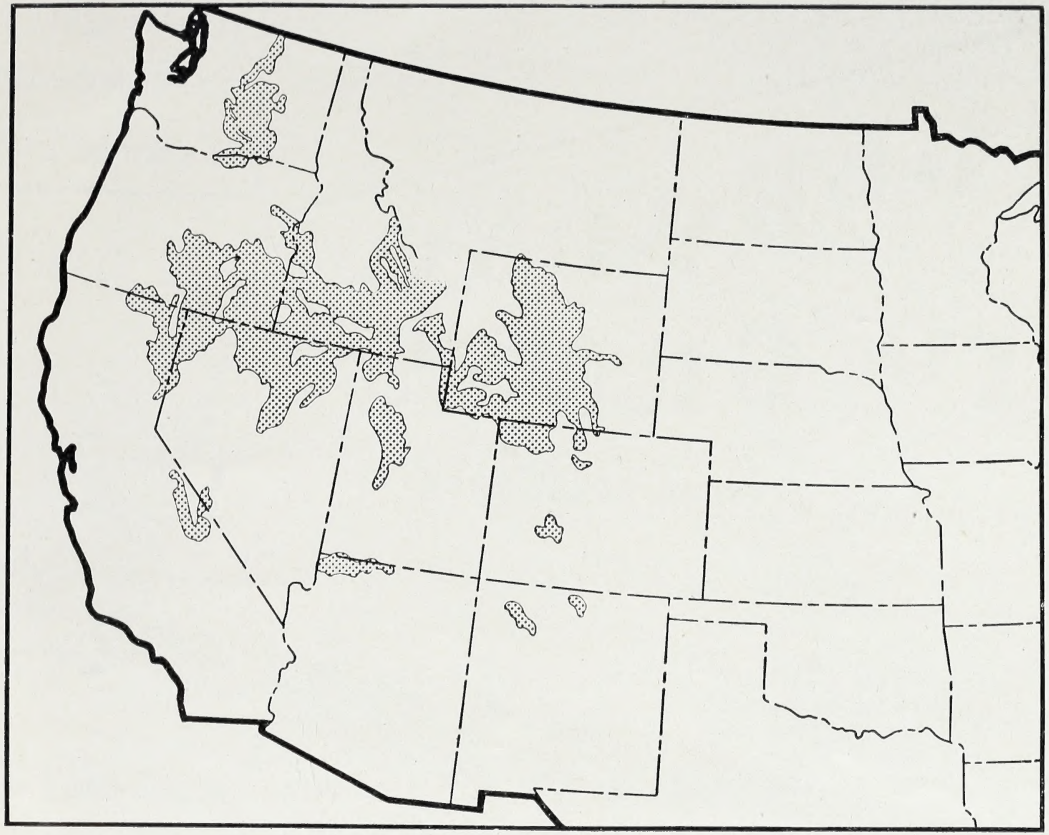
U. S. DEPARTMENT OF AGRICULTURE

SAGEBRUSH TO GRASS

REBUILDING WESTERN RANGE LANDS BY ELIMINATING SAGEBRUSH AND PLANTING GRASS

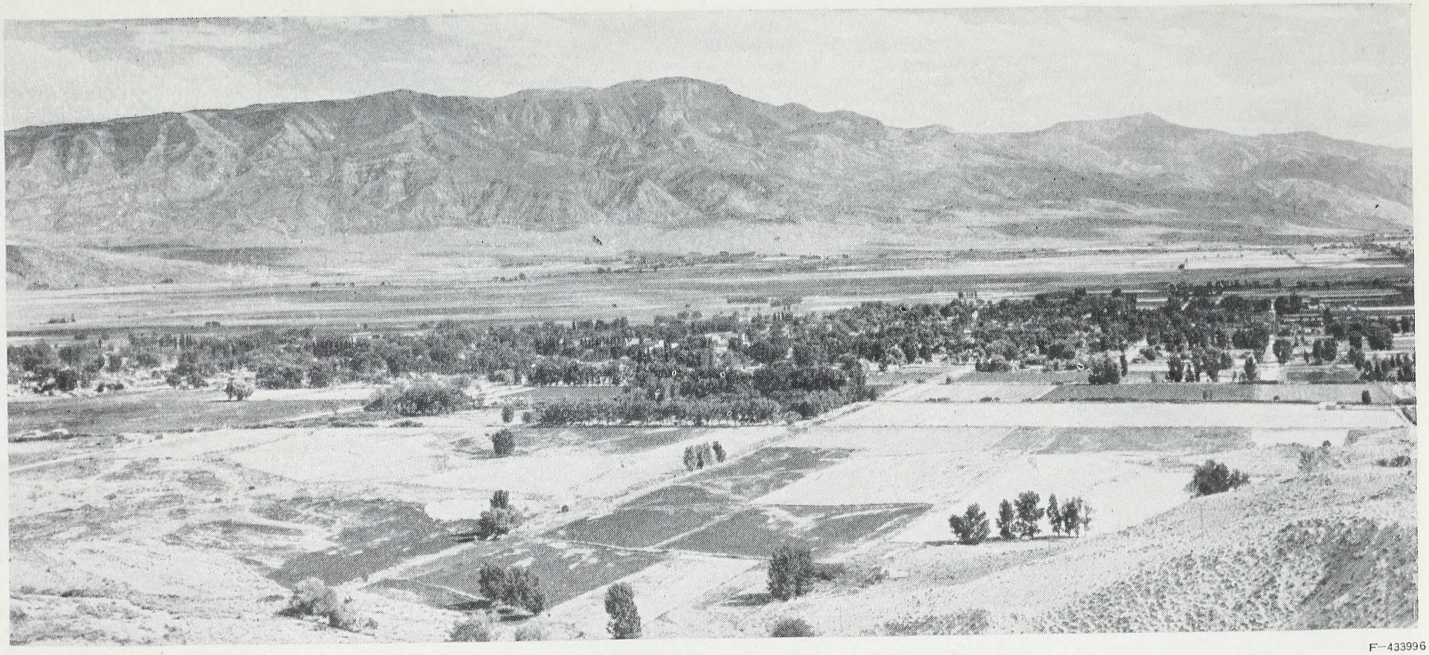
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
AIS 27 AUGUST 1945



THERE ARE 96.5 million acres of sagebrush land on the western range. A large portion of them are now partly or wholly unproductive.

These lands *challenge* the livestock industry.

More forage is needed. It can be grown on millions of acres of sagebrush lands.



F—433996

Our western rural economy is essentially a farm-livestock-range economy.

Between most western rural communities—like this one, Richfield, Utah—and the summer range lands in the high mountains, lies a sagebrush belt used as spring-fall and winter range for cattle and sheep.

The forage on 10 to 15 acres of this rough sagebrush land is required to graze 1 cow for 1 month. Turn it into grassland and **1 acre** will graze 1 cow for 1 month.

To meet increasing needs for more range forage, sagebrush lands must literally "go to grass."

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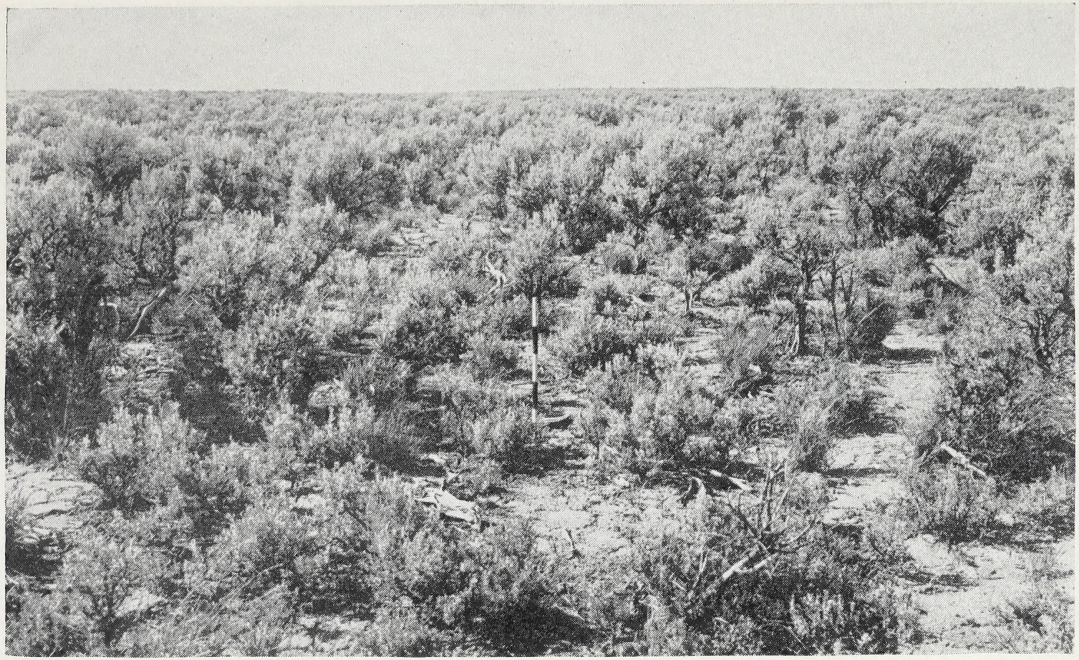

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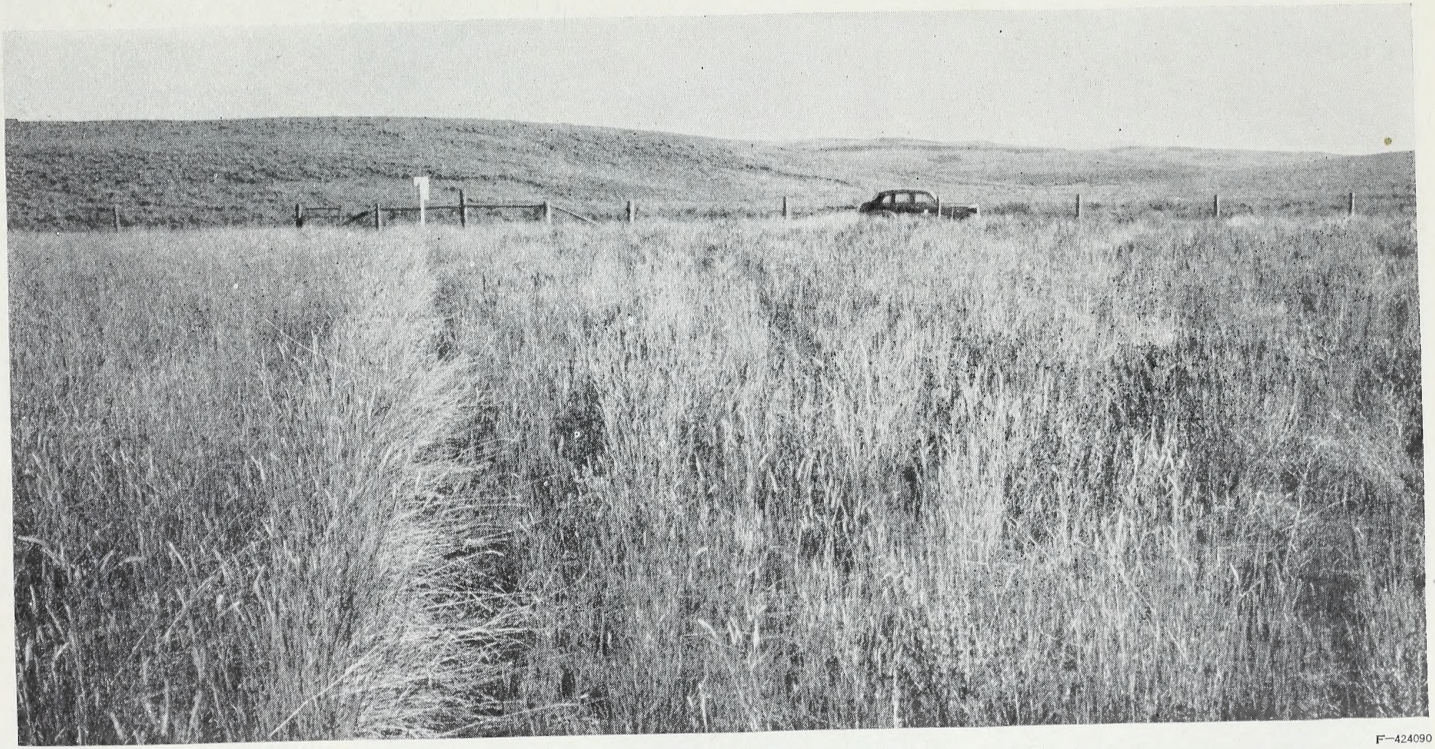
Extensive tests and large-scale plantings have proved that sagebrush lands reseeded with grass will grow 5 to 15 times more forage—the nutritious kind that makes **tender** beefsteaks and mutton chops.

Western sagebrush lands today present many problems. In some areas, the brush is too dense for foraging animals to get through. Other areas are heavily overgrazed and burned, providing little or no forage for cattle and sheep.

When grazing capacity has been so greatly reduced, there is strong pressure on other ranges to carry more than their share of the grazing load. Such overcrowding offers only temporary relief, however, and usually results in depletion of the range receiving the overflow.

There is a better way. The Forest Service has shown how to grow dense stands of grass—abundant forage for livestock—on these lands. Many sagebrush areas have suitable soil, topography, altitude, and rainfall.



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Growing grass on sagebrush land is now past the experimental stage, as hundreds of test seedlings like this in the Intermountain region can attest. Five years after planting, the grass on this reseeded area in Idaho has spread 12 feet into the brushland on the right.

Note the contrast between this picture and that on page 2, the same area before being reseeded.

F—433998

Seriously depleted areas like this mountaintop on a critical watershed are the result of overgrazing—of not having enough forage for our livestock.

A grubbed area like this is ruined for grazing. It has changed from an asset to a costly liability.

Run-off during heavy rains on such mountaintops silts-in irrigation ditches and reservoirs on farms below. Such areas are the birthplaces of floodwaters which tear out dams and bridges, inundate fertile fields, wreck towns, and leave behind despair and desolation.

Grass grown on more sagebrush land will help restore these sore spots because the livestock now being grazed on them can be removed—and better fed elsewhere.

F—433997

A scene like this makes the story plain. Modern reseeding methods have converted this former sagebrush area on Lost Creek, Fishlake National Forest, Utah, to grasslands—producing 12 times more forage.

This sort of land-restoration is giving the livestock industry a "shot in the arm."

GENERAL GUIDES FOR RESEEDING

SELECT GRASSES

Use grass species adapted to the lands to be seeded and make sure you get clean, live seed. Testing your seed will repay the extra effort. Use enough seed to get a good stand, but not more than necessary.

* *

CHOOSE PLANTING SITE

Avoid rough rocky ground and shallow infertile soils. Annual rainfall must be not less than 8 to 10 inches, with at least 2 or 3 inches during the spring growing season. The best crops of grass can usually be grown on deep, dark, rich soils, where sagebrush (and rabbitbrush) are thickest.

* *

REMOVE COMPETITION

Brush species use too much of the ground moisture available for plant growth. They must, therefore, be killed out if a high-yielding stand of grass is to be established. This is the first step in the reseeding operation.

* *

PLANT CORRECTLY

Put the seed in the ground just before the fall rains, so that the rainfall will keep the soil moist for a month or more of growing weather. Plant seeds at a depth of $\frac{1}{4}$ to $\frac{3}{4}$ inch. Plant small seed no deeper than $\frac{1}{2}$ inch. It is essential that the seed be covered. Broadcasting the seed without proper covering is successful only when moisture conditions are unusually favorable.

* *

GRAZE CONSERVATIVELY

Protect the new plants from premature grazing. They should be allowed to become well established with strong root systems.

Graze the new stand of grass conservatively so it can maintain itself.

F-433999

Grasses cannot grow abundantly where they must compete with sagebrush for soil moisture and sunlight. After you have chosen the site, clear the ground. The wheatland plow kills out sagebrush and rabbitbrush effectively and prepares a good range seedbed.

Seed may be broadcast behind the plow and covered by soil sloughing or harrowing it, or, if the sagebrush is not too thick, it can be drilled in after the brush is torn out. The uprooted brush need not be cleared away unless it is very dense. If the seed is to be drilled, the sagebrush should be plowed out in time to allow the soil to settle before seeding.

F—434000

This self-clearing harrow, developed on the Dixie National Forest, removes smaller sagebrush and at the same time stirs up the soil to cover the seed. The harrow is used on lands too rough and rocky for ordinary farm harrows or wheatland plows.

The grass seed is here being broadcast in front of the harrow. Where soil and moisture are favorable, no further treatment is needed to get a good crop.

F—413247

Some sagebrush lands can best be cleared by controlled burning. How and when are explained fully in U. S. Department of Agriculture Farmers' Bulletin 1948, "Sagebrush Burning . . . Good and Bad." This sagebrush range was cleared by burning 3 years before the picture was taken and reseeded the same fall. Results: A splendid stand of crested wheatgrass and a grazing capacity far greater than that of the sagebrush land.

This range in Johns Valley, Dixie National Forest, was formerly abandoned farm land that started to go back to brush. Reseeded to crested wheatgrass, it is now providing forage to relieve an overstocked cattle allotment.

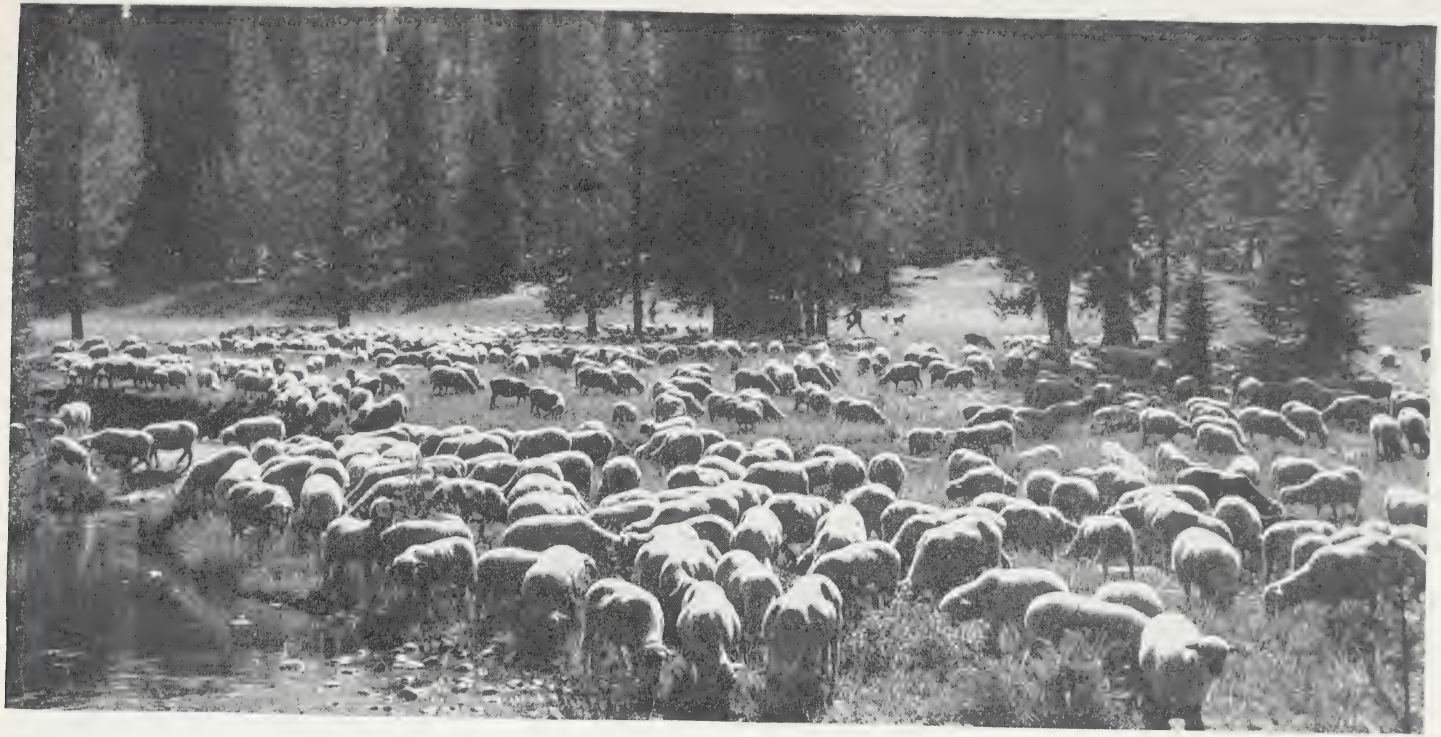
Planting was done with a 16-foot single-disk drill. The seed was sown in rows 12 inches apart, at the rate of 5 pounds to the acre.

Where the summer forage supply is critical, the reseeding of spring-fall ranges can help solve the problem. Animals can be kept longer on the new forage produced on spring-fall ranges—thus reducing the grazing season on summer ranges.

Until 1942 the sagebrush on this section of the Upper Valley cattle allotment on the Dixie National Forest grew thick and tall.

Note the fine stand of grass after seeding.

F—434001



F—38998

Grass is a wealth-producing crop and a soil binder, vital to the economy of all the range States. More and more sagebrush lands reseeded to grass will help preserve and strengthen the livestock industry of the West.

All of us can work toward that objective.

GETTING DOWN TO CASES

Upper Valley, Dixie National Forest, Utah

In 1941, the Upper Valley cattle allotment was considered by forest officers to be 50 percent overstocked. There were 1,267 cattle permitted from June 1 to October 31. Many animals left the forest in such poor flesh they could not be driven to their winter range on the desert.

Beginning in 1942 and continuing for the next 2 years, 1,200 acres of the allotment's dense sagebrush land were plowed with a wheatland plow and drilled to rye and crested wheatgrass at a cost of $4.10 per acre.

In 1943 the reseeded land, 800 acres, provided 805 cow-months of forage. In 1944, 1,000 acres provided 971 cow-months of forage. By 1946, when the 1944 seeded area will be opened to grazing, about 1,200 acres of grass forage will be available instead of 1,200 acres of heavy sagebrush.

As the forest supervisor says in his annual report with regard to this allotment, "Reseeding will have improved conditions 20 percent; shortening of the summer grazing season will take care of another 20 percent; and fencing and transfer reductions will account for the remaining 10 to 12 percent by 1946." Thus, the overstocking will have been entirely corrected.

Ranchers are strengthening their inadequate economy by growing more forage. "Work in the Upper Valley," adds the supervisor, "pioneered the way in reseeding the range in the Escalante section. As a result, a good deal of range reseeding is being done by individuals on privately owned land. This improvement of the adjacent range will be a direct benefit to the national forest."

Lost Creek, Fishlake National Forest, Utah

On many national-forest grazing allotments in the sagebrush belt, sagebrush and rabbitbrush grow in expansive, unbroken stands and flourish in the deeper, richer soil of drainage bottoms. Typical is the range on the Lost Creek-Boobe Hole cattle allotment of the Fishlake National Forest, which was stripped of its better forage plants by uncontrolled grazing long before the creation of the national forests.

From 12,474 cow-months in 1918, its obligation (numbers permitted to graze for a definite length of time) has, by a series of reductions in numbers and seasons, dropped to 6,001 cow-months. This is still 1,500 more than the present estimated grazing capacity of the range.

To help save the range and the industry dependent upon it, ground was broken on the Lost Creek reseeding project in the fall of 1942. Five hundred acres planted to a mixture of crested wheatgrass, slender wheatgrass, smooth brome, and mountain brome at a cost of $3.22 per acre, are yielding, now, 3 years later—

A sustained crop of grass, not a gradual loss of range and soil.

Forage for an estimated 100 cows instead of 8 to 9 cows for 4 months.

Four hundred cow-months more forage, increasing the grazing capacity of this range to 4,900 cow-months.

Stimulation of interest among local stockmen by showing them what can be produced on their own sagebrush land.

Other devices used in rehabilitating the Lost Creek range were: The construction of zone fences to keep the stock from deferred spring and summer ranges until the plants were ready to graze; postponement of the opening of the grazing season from May 11 to May 26; and deferred grazing of 800 cattle until June 1 and later.

A good beginning has been made toward adjusting this allotment to its grazing capacity—the goal on all national-f effort will finish the job. Sustaining the livestock's food supply is the only way to sustain the industry.

Cooperative Experimental Range Pastures,[1] Benmore, Utah

Two thousand seven hundred acres of range land in the Central Utah Land Use project on which an effort was made at dry farming and then abandoned were sowed to crested wheatgrass and divided into twenty-seven 100-acre experimental pastures. In 1944, 11 of these pastures were grazed by 200 cattle (all ages) from April 20 to July 1—about 10 weeks—and again in the fall for 6 weeks. To check results, 50 cattle were grazed at the same same time on adjacent unbroken sagebrush and abandoned dry farm land.

The 200 cattle inside the pastures gained weight at the rate of 1.8 pounds per head per day during the spring period. At the same time the 50 cattle grazed outside on the unseeded range gained 1.1 pounds per head per day. In other words, about 11 times more meat per acre was "grown" on the reseeded land. The grazing capacity was increased 7 times.

On the abandoned dry farm land grown up to weeds and unbroken sagebrush the grazing capacity was not more than 1 cow-month for 10 to 12 acres. In the reseeded pastures, it was 1 cow-month for about 1.5 acres.

The 200 cattle were kept off their overgrazed national-forest range from May 15 to July 1—6 weeks. This year (1945) 400 head were kept off until July 1, relieving the national-forest spring range of more than half its burden (about 750 permitted cattle) and allowing it to recover from overuse.

USE OF CRESTED WHEATGRASS

Crested wheatgrass is probably the most successful species of grass yet found for seeding the valleys, lower mountain slopes, and foothills of the Intermountain region. It can be established in good stands in most soils. Once started, it is drought-resistant, hardy, long-lived, and deep-rooted. The palatability of crested wheatgrass to cattle and sheep has been demonstrated by numerous examples. It grows early in the spring and is probably best grazed then, thus helping to solve the problem of early spring forage. Five or eight pounds of crested wheatgrass per acre is sufficient to obtain a good stand where it can be drilled. On steep rough country, or on lands where the uprooted brush is so thick that a drill cannot be used, the seed can be broadcast by hand or mechanical broadcaster at the rate of 7 to 8 pounds per acre.

Crested wheatgrass can be planted alone, but there are certain advantages in planting other grasses with it, if the site is suitable for them. Because of different growth habits, mixed grasses can provide nutritious forage over a longer grazing season and can utilize the available soil moisture more efficiently than a single species. Smooth brome, slender wheatgrass, and western wheatgrass can be used with crested wheatgrass where moisture and soil conditions are better than average. If a fast-growing grass is included, there is the added advantage that it reaches a high forage production sooner.

[1] The experimental range pastures are located on the Soil Conservation Service's Research Project Area at Benmore, Utah, where the Soil Conservation Service, the Utah Agricultural Experiment Station, and the Bureau of Plant Industry, Soils, and Agricultural Engineering are cooperating with the Forest Service in some investigations dealing with the rehabilitation and restoration of abandoned cultivated range lands through reseeding, management, and conservation of soil and water.

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